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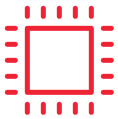
Deploy an enterprise software foundation for Arm-based workloads



Gain benefits across your IT environment

Red Hat Enterprise Linux for ARM provides key benefits for datacenter operators.

With Red Hat Enterprise Linux for ARM, you can:

- Reduce power consumption.
- Lower operating costs.
- Ensure consistent uptime.
- Deliver predictable performance.

Advancing technologies bring new opportunities

Across industries, IT organizations are adopting new technologies to meet the growing needs of modern, critical business applications and services. On-demand infrastructure and services from public cloud providers help IT teams manage dynamic workloads, streamline application development, and reduce operational overhead. Edge devices integrated into hybrid cloud environments can also help. Edge environments extend computing capabilities closer to the point of data generation to support real-time processing, reduce latency, and enhance data transfer efficiency. And advanced servers and hardware solutions deliver improved price-performance and energy efficiency to meet the computational demands of modern workloads.

As a key component of many of these new technologies, Arm processors are central processing units (CPUs) based on reduced instruction set computer (RISC) architectures that balance energy efficiency, performance, and cost. Found in more than 280 billion chips, Arm processors are used in a diverse range of compute devices, from smartphones and Internet of Things (IoT) endpoints to edge computing platforms and high-performance server environments.[1] In fact, Arm-based instances are available in every major cloud, including Amazon Web Services (AWS), Microsoft Azure, and Google Cloud, offering predictable performance, massive scalability, and optimized pricing.

Explore the value of new datacenter solutions and processor technologies

Managing a modern datacenter can be challenging. IT organizations must maximize compute performance and scalability while ensuring energy efficiency and cost control. Building an environment that addresses these challenges and meets evolving digital demands while mitigating environmental impacts requires innovative solutions and collaborative efforts. Arm processors offer new opportunities to increase efficiency, performance, and flexibility across a diverse range of environments and workloads.

Power efficiency

Datacenter infrastructure—including servers, networking equipment, and cooling systems—consumes vast amounts of power, making energy efficiency a critical factor for IT organizations of all sizes. Arm processors consume significantly less power and generate less heat for certain workloads, making them ideal for IT environments in which energy conservation is crucial. In fact, Arm Neoverse processors perform 2 to 3.5 times more work per watt than traditional processors, reducing both the carbon footprint and operating cost of applications.[2]

1 "Arm is everywhere technology matters." *Arm*, accessed 29 February 2024.

2 "Hyperscale datacenters and cloud computing." *Arm*, accessed 29 February 2024.

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Reduce power and cost

AWS Graviton-based instances with Arm processors can help you reduce cost by up to 20%, and use up to 60% less energy.[4]

Learn more about AWS Graviton-based instances.

Optimized performance

Every workload has unique requirements for compute resources—including processor time, memory space, and input/output (I/O) bandwidth—that must be met to provide optimal user experiences. Because Arm architects, designs, and licenses intellectual property (IP), hardware providers can develop and manufacture Arm processors that are tailored to specific workloads and performance requirements. As a result, you can customize your IT environments at the hardware level to deliver specialized performance profiles for critical applications and optimize overall resource use.

Scalability

As business grows, demands change, and technology advances, datacenter scalability is critical for managing workloads without compromising performance and reliability. With a customizable, modular design, Arm processors scale to handle a wide assortment of workloads from lightweight web servers to high-performance computing (HPC) applications. Ideal for rapidly growing datacenter environments that require flexible hardware solutions, Arm processors help your organization remain agile in a competitive landscape with evolving requirements and dynamic market trends.

Ecosystem and collaboration

Vibrant, diverse ecosystems that foster innovation and collaboration across industries let organizations select advanced technologies from a variety of hardware vendors, software developers, and open source communities. Within the Arm ecosystem, hardware vendors customize, optimize, and manufacture solutions for a range of devices, while a robust software community provides operating systems, development tools, libraries, and applications optimized for Arm architectures. This ensures compatibility and integration across platforms and encourages continuous technology advancements that expand the capabilities of Arm-based solutions.

Cost

As applications and workloads require more compute resources, the price-performance of datacenter infrastructure becomes a critical factor for IT organizations. Arm processors can help you reduce both capital and operating expenses (CapEx and OpEx) with devices and manufacturing options that provide predictable performance while consuming less energy. In fact, many organizations that switch to Arm-based cloud resources experience up to 40% improvement in price-performance for their applications.[3]

Run your critical applications on Arm-based systems

Applications are at the core of modern businesses. Today's IT organizations must deploy and manage a variety of critical workloads—from traditional enterprise applications to modern, cloud-based services—each with their own requirements. This range of requirements presents challenges in resource allocation, performance optimization, and scalability. Accordingly, many organizations choose Arm processors to run their critical business workloads as they continuously adapt and innovate.

3 "Cloud computing." *Arm*, accessed 29 February 2024.

4 "AWS Graviton processors." *AWS*, accessed 29 February 2024.

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Arm processors deliver benefits for many of the workloads that businesses rely upon.

- **Web services.** The modular, customizable design of Arm-based servers provides increased flexibility, scalability, and resiliency for modern web services, including cloud-native applications and containerized microservices.
- **Media services.** Arm architectures protect against *noisy neighbor* effects, resulting in less jitter, lower latency, and greater predictability for audio and video workloads.
- **Data analytics.** With high core counts and efficient single-threaded operations, Arm processors provide consistent, predictable performance for processing and analyzing large datasets in open source distributed computing frameworks and databases.
- **Artificial intelligence and machine learning (AI/ML).** Arm-based servers deliver performance and power efficiency to intelligent applications and AI/ML workloads—including training and inference tasks—with support for popular frameworks like TensorFlow and PyTorch.
- **High-performance computing.** Due to their energy efficiency and massive scalability, Arm processors are ideal for HPC clusters that run compute-intensive workloads for scientific research and engineering simulations.
- **Telecommunications.** As a key component in many telecommunications and networking environments, Arm-based servers improve the energy efficiency and reduce the environmental impact of 5G and virtualized radio access network (vRAN) functions.

Deploy a common software foundation across your entire IT environment

Red Hat Enterprise Linux for ARM is part of a comprehensive portfolio of operating systems that provides consistent deployment and management experiences across diverse environments.

Learn more about the Red Hat Enterprise Linux operating system portfolio.

Standardize on a consistent, reliable software foundation

The flexibility to choose the right hardware is critical for supporting modern workloads like AI/ML-based applications and large database implementations. Red Hat® Enterprise Linux® for ARM brings enterprise operating system features to Arm-based infrastructure, allowing you to choose the most effective and efficient hardware for each of your workloads. With Red Hat Enterprise Linux for ARM, you can take advantage of reduced power consumption and operating costs while ensuring consistent uptime and predictable performance for critical applications.

Red Hat and Arm certify and deliver Linux features and capabilities that are unique to Arm architectures. Red Hat commercially hardens these features in Red Hat Enterprise Linux for ARM to help improve the security, reliability, and stability of Arm-based workloads. For example, support for 64k page sizes in Red Hat Enterprise Linux for ARM maximizes performance of memory intensive workloads on datacenter-class Arm-based servers with large physical memories. And Kernel-based Virtual Machine (KVM) versions for Arm architectures let you deploy consistent, standardized virtualization technologies across hybrid cloud environments.

Arm is also an active member of the Linux Kernel project and developer of the fundamental Arm architecture enablement for the Linux kernel. By maintaining Linux kernel trees for Arm 64-bit systems and actively contributing to trees for traditional Arm 32-bit systems, Arm helps ensure a reliable foundation for Red Hat Enterprise Linux for ARM.

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Choose your cloud provider

Red Hat Enterprise Linux for ARM is available in major public clouds.

Get started today with the cloud provider of your choice:

- AWS
- Microsoft Azure
- Google Cloud

Operate consistently across cloud environments

Red Hat Enterprise Linux includes many optimizations to ensure reliable, security-focused performance in the cloud. It provides a consistent operating foundation for hybrid and multicloud environments, so you can run applications where it makes the most sense.

Learn more about the value of Red Hat Enterprise Linux: An ideal operating system for cloud.[5]

Red Hat Enterprise Linux for ARM is part of the complete Red Hat Enterprise Linux platform portfolio, so you can deploy a consistent operating foundation across your entire IT environment. Simplify deployment and management of your entire environment—including your Arm- and x86-based servers—using a single, standardized operating system and set of management tools. Streamline application development and deployment processes with a reliable set of operating system images, toolchains, libraries, container tools, and runtimes. Live kernel patching, built-in security profiles, security standards certification, and a trusted software supply chain help mitigate risk, automate security, and maintain compliance. And comprehensive performance monitoring, tracing, and analysis tools let you detect anomalies, analyze system performance, and apply best practices to optimize your infrastructure.

Finally, no matter where you deploy Red Hat Enterprise Linux for ARM, you are backed by Red Hat's award-winning support organization. Working in close collaboration with Red Hat engineering and product teams, Red Hat support teams solve issues in less time and with less hassle for you. Red Hat also works with cloud partners to provide expertise, knowledge, and, in some cases, joint support models to ensure you can successfully accomplish your goals with Red Hat solutions in your datacenter, in the cloud, or at the edge.

Deploy Red Hat Enterprise Linux for ARM anywhere

Red Hat Enterprise Linux for ARM delivers more value for your organization, providing a flexible, stable, and reliable foundation for hybrid and multicloud environments. This cloud-ready, security-focused operating system provides a consistent, tailored experience across footprints—including physical and virtualized infrastructure in both on-site datacenters and public cloud environments. Deploying Red Hat Enterprise Linux for Arm on all of your Arm-based servers can help you improve productivity, security, and operations on energy-efficient, cost-effective hardware.

Standardizing on Red Hat Enterprise Linux for ARM provides the consistency needed to maintain a security-focused and compliant hybrid environment. A modular package structure reduces your attack surface and helps protect your systems in the cloud. Best practice-based default settings help you configure your systems for increased cloud security from the start. And an included identity management tool lets you adopt zero trust architectures more easily.

All Red Hat Enterprise Linux subscriptions, including Red Hat Enterprise Linux for ARM, also provide access to Red Hat Insights. Red Hat Insights is a suite of hosted services that helps you manage and optimize hybrid and multicloud environments. Accessed through the Red Hat Hybrid Cloud Console, Insights uses predictive analytics and deep domain expertise to speed and simplify operational tasks. It also works across on-site and cloud environments, so you can manage everything from a single interface. With a focus on operations, security, and business outcomes, the services within Red Hat Insights help you stay ahead of critical issues and free your staff to focus on innovation.

You can also deploy Red Hat Satellite for management at scale. Focused on operational efficiency, Red Hat Satellite streamlines system management and automates common tasks to help increase the security, availability, and compliance of your hybrid cloud environment. Red Hat Satellite lets you provision, maintain, and migrate your entire infrastructure—including all of your Red Hat Enterprise Linux for ARM systems—in physical, virtualized, cloud, and edge environments from a single console.

5 Red Hat brief. "Red Hat Enterprise Linux: An ideal operating system in the cloud," 28 Nov. 2022.

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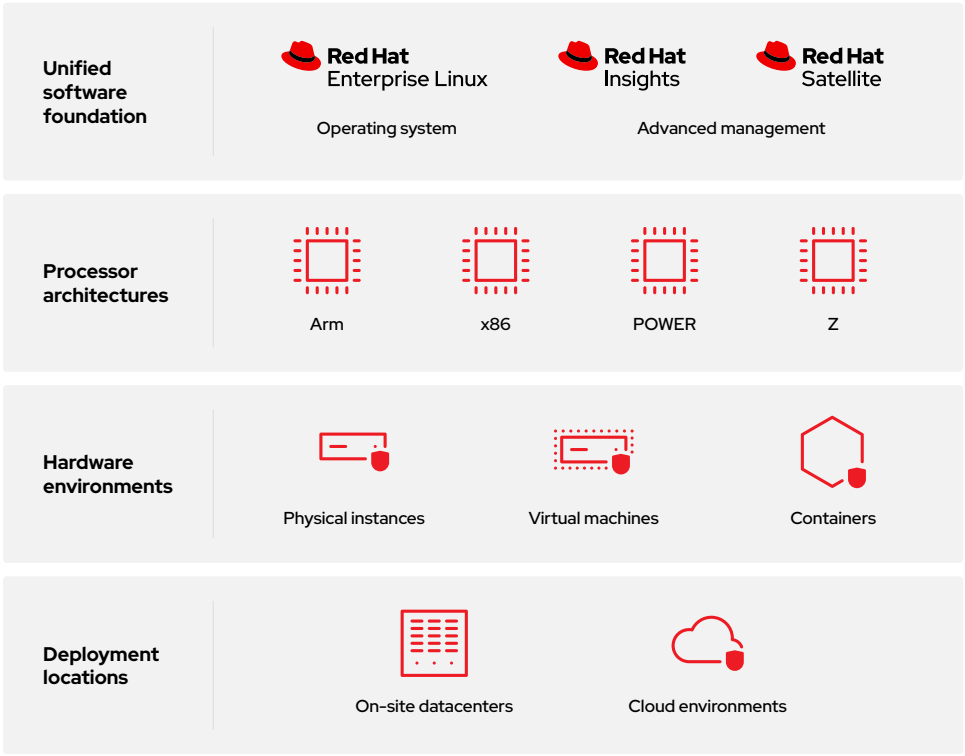

Figure 1. Speed and simplify operating system management across diverse environments.

Accelerate open, collaborative innovation with Red Hat and Arm

Red Hat and Arm collaborate to deliver modern platforms that help organizations innovate rapidly and reliably. Through leadership roles across industry-wide organizations, we advance open standards initiatives that foster interoperability, speed innovation, and promote collaboration within the broader community and our technology ecosystems. With our jointly engineered solutions, developers can build applications on their choice of foundational software and hardware platforms. And with energy-efficient platforms, we help organizations worldwide deploy innovative IT solutions that meet their environmental and sustainability goals.

Red Hat Enterprise Linux for ARM brings Red Hat's large certified partner ecosystem to the Arm architecture, so you can adopt new technologies across your organization. Through an early-access program, you can collaborate with our Arm partners—each with collaborative engineering efforts and tested, certified deployments—to evaluate new technologies. Plus, Arm's SystemReady compliance certification program—based on hardware and firmware standards—ensures that you can install and run Red Hat Enterprise Linux for ARM across different footprints simply and reliably.

Explore a comprehensive partner ecosystem

Learn more about Arm-based platforms certified with Red Hat Enterprise Linux in the Red Hat Ecosystem catalog.

Innovating across industries

Red Hat and Arm work together to provide innovative solutions for a variety of industries. For example, we collaborate to deliver more energy efficient 5G and vRAN solutions for the telecommunications industry.

Read the blog to learn more.

Learn more

Red Hat Enterprise Linux for ARM gives you the flexibility to deploy critical business applications on the processor architecture that makes the most sense while maintaining a consistent, efficient, and manageable foundation across your entire IT environment.

Try Red Hat Enterprise Linux for ARM 64 with a free, 60-day, self-supported subscription. This subscription also includes access to Red Hat Satellite and Red Hat Insights, so you can explore the benefits of proactive system management and predictive analytics. You can also take advantage of Red Hat Customer Portal for comprehensive documentation, helpful videos, and informative discussions.

Get started today with your Red Hat Enterprise Linux for ARM 64 trial.

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